

## DIMENSIONS OF SUBSISTENCE FORAGING IN SOUTH INDIA

Anthropologists have long argued that foragers of Southeast Asia and the Indian subcontinent have categorically different settings and adaptations from those in Australia and the Americas. Some hold, for instance, that the cultural environments of tropical Asian foragers—their enclavement and intimate, long-term contact with powerful and sophisticated neighbors—have profoundly shaped their economies and social structures (e.g., Parker 1909; Kroeber 1919, 1945; Bose 1956; Service 1962; Alchin 1966; Gardner 1966, 1991b; Deetz 1968; Fox 1969; Morris 1977, 1982; Peterson 1978a, 1978b). There has also been debate as to whether the natural environments of tropical foragers can support true hunting and gathering, the most central issue having to do with the availability of wild sources of carbohydrates in rain forest (Hutterer 1983; Headland 1987; Bailey et al. 1989; Brosius 1991; Endicott and Bellwood 1991; Bailey and Headland 1991). With India, however, we are dealing mainly with yam-rich monsoon forest, not rain forest. Notwithstanding this plenty and based on a survey of five cultures which were described early in the century (Figure 1), Fox (1969:142) finds reason to ask whether there is such a thing as subsistence foraging in contemporary south Asia. He poses the thesis that the so-called hunters and gatherers are "economic specialists for traditional Indian civilization." One corollary of his theory is that "hunting and gathering. . . [in the region] only 'pays' to maintain as an occupational specialization when it produces goods valued by the larger society" (Fox 1969:142). Indeed, he (Fox 1969:141) proposes that "their economic process and well-being are dependent on the barter. . . ." These are important theories and proposals. Yet, due in part to the dearth of adequate published data, few of them have received more than preliminary testing.

This article describes the subsistence foraging of Paliyans in Tamil Nadu, south India. The data were collected in 1962-64 and 1978, as an integral part of general ethnographic inquiry.[ 1] But because my main concerns were social structure, social control, and contact phenomena, I did no immediate, detailed examination of the (data on subsistence; Paliyan foraging was described only in brief, summary form (Gardner 1972:412-18). Given the questions about subsistence foraging being raised today, review of the entire corpus of my field notes has finally been undertaken. The resulting picture is more complete than had been anticipated, some corrections are found necessary, and the final description does indeed bear relevance to several of the theories. It should be noted that subsistence data are also becoming available on other south Indian foragers, such as the Malapandaram (Morris 1977, 1982) and Nayaka (Bird-David 1990). Figure 1 shows the location of the recently studied peoples.

It needs to be said from the outset that examination of the locations and movements of 24 Paliyan groups has shown that contact situations affect the size of groups, their settlement patterns, their resource bases, and their subsistence practices (Gardner 1985:413-16). For instance, small seminomadic groups that stay away from the low altitude frontier zone (where they would be in contact with south Indian society) are usually found to be avoiding recently abusive neighbors. They are temporary refugees, not persisting cultural conservatives. While mobility, aloofness, and evasiveness allow Paliyans to escape from harassment, the cost of safety may be a loss of certain frontier zone resources (including both jobs and good yam beds).

From an ethnographer's viewpoint, several features of the overall system are relevant. First, the oscillation between contact and aloofness is generally of short enough period that all but the youngest will have been involved with life in both settings (Gardner 1985:420-21). Second, the evasiveness of the more nomadic groups complicates entry to the field, conducting participant observation, and thus obtaining valid interview data. Brief work with three deep forest groups was made possible in each case by my entering with someone they trusted. But, after four days contact, members of one fairly aloof band (one that was especially well suited for my study) packed in about twenty minutes and left their high altitude valley, not to return for three months. As later reconstructed, it was the similarity between the color of my clothing and that of recent, visiting police investigators that triggered their flight. In the course of nineteen months I procured subsistence data from ten diverse groups, but it was with two communities in the frontier that I was able to do the most extensive and empirically sound observational and interview work. Both groups were larger than average. The first represented recent coalescence of one band with parts of two other closely related bands; it was unstably constituted and its members and subgroups cycled in and out of the frontier during the period of fieldwork. The other was a more stable settlement, over a century old (Gardner 1988). Individuals and families still joined and left it, though, and most families continued to rely on foraging in addition to agricultural labor (which was seasonal).

One problem I experienced with every Paliyan group, in forest and frontier alike, was ascertaining the frequency and effectiveness of small game hunting. Although I participated in nine hunts and received meat from several others, I found that people tended to be private about their consumption of individually caught small game. Often it was cooked and eaten right away in the forest; some meat which I knew to have been brought back to camp was not cooked openly; and my inquiries about hunts in which I had not been a participant were brushed aside with smiles, generalizations, and other evasion. Given the Paliyans' concern with privacy, their avoidance of discussing their own successes, and their reluctance to talk about one another, I found no obvious way to undertake valid general inventories of hunting or meat consumption. Having already watched a study group disappear, I judged it wise to limit inquiry once I reached a point at which even my reliable consultants deemed it to be intrusive and offensive.

The next section of this paper provides a brief description of the environment in which Paliyans forage. The three sections that follow describe the Paliyans' wild foods and foraging techniques. Then we will look at their hierarchy of resort in times of food scarcity and their two-sided approach to subsistence. Finally, employing the newly available south Indian data and some relevant materials from elsewhere, we will close with a re-examination of one of Fox's main generalizations.

### THE PALIYAN ENVIRONMENT

Paliyans live in a relatively dry monsoon forest on the lower, eastern slopes of India's southernmost ranges (8 degree 30' to 10 degree 25' north latitude). The hills present an imposing face to the plainsmen below. The east-west Palni-Anaimalai range in particular appears as a steep wall, hung much of the time in cloud and mist. Looked at from above, the Palni part of the range constitutes a rolling, 2,100-2,200 meter high plateau of 270 square kilometers, dotted with peaks of 2,440-2,555 meters. Extending due south from the first great line of hills is the 900-1,500 meter high Elamalai (Cardamom Hills) range, which few Paliyans frequent. About 65 kilometers to the south of that juncture, some spurs of hills (e.g., the Varushanad Hills) converge with the Elamalais from the northeast. Where they converge they form a 1,000 square kilometer, very uneven plateau over 900 meters high. South of it, after a brief gap, there is one more range, extending 95 kilometers south into the very tip of India. The Varushanad Hills, the plateau, and the southernmost range have some peaks that attain altitudes of 1,400-2,000 meters. The face of the hills varies; it is precipitous and difficult from many quarters and gentle from others. The same is true of the valleys that punctuate the wall. Some terminate suddenly, walled in on three sides by steep rock and floored by verdure along the course of swift, cold rivers, while others offer easy access to the forested interior.

Rain is a major factor determining the flora and condition of the soil. The timing and amount of rain vary considerably by range and by altitude. If their orientation is right, some upper slopes experience two plentiful rainy seasons annually (June-September and then October-November). The upper Palnis for instance, receive a mean of 1,680 millimeters per year. By contrast, rainshadow areas are lucky to get even one meager monsoon and sometimes go for many months with no appreciable rain. Annual precipitation is said locally to be as low as 250 millimeters, which is probably an underestimate.

About 30 rivers flow year round from the upper Palni range because of its double monsoon. Smaller streams in the Palnis and perhaps the majority of the rivers on the eastern side of the smaller ranges to the south tend to dry up seasonally. During the rains water runs off the slope quickly, swelling the rivers temporarily into impassable torrents.

The vegetation profile of southern hills in the Paliyan region can be abstracted from the literature. There are six fairly distinct zones of growth (see Figure 2). Field experience suggests that the slope varies between a dry profile (e.g., having zones I, II, V, and VI) and a relatively wet one (with zones I, III, IV, V, and VI). No one hillside is made up of all six zones and there is considerable variation even within a range. Most slopes do, though, have a dry zone comprising the lowest few hundred meters. Let us review the botanic zones, starting from the foot of the hills.

Zone I (305-610meters), the dry thorn forest, occurs in areas of marked rain-shadow,

. . . on dry lateritic, basaltic, granitic rocks and poor soils. The forest is characterized by species of *Acacia* with an open growth. The crowns of the trees are spreading but do not meet. Second story is very poorly developed, consisting of spiny and xerophytic species. Shrubs of similar nature are present. The soil is usually bare and some grassy growth may appear during the short monsoon. The few climbers that are present have xerophytic features. Such forest types are clearly the result of biotic features of browsing by sheep, goat, camel, etc. (Puri 1960:247).

This zone may lack trees, and even where the forest is supposed to be protected, there is large scale grazing and wood cutting. In the wake of this destruction, clearings soon revert to suffocating thorny growth which recloses the area. The major species include various acacias including umbrella thorn babul, thorny jujubes, and species of *Euphorbia* cactus such as milk hedge (Puff 1960:249). Many Paliyans live in zone I. They find here several species of their *Dioscorea* yams but they can be difficult to dig because the soil is dry and stony. Digging stick wood grows near river beds where there is more moisture. Figure 3—showing topography, Paliyan camps and rock shelters, and resources—illustrates the way the boundary between forested hills and cultivated plain approximates in general the 305 meter ( 1,000 foot) contour line. In this particular Paliyan area the lowest Paliyan camps are right at the forest's edge, slightly below 300 meters in altitude; further north the boundary is just above the 305 meter line.

Zone II (305-1,065 meters), dry tropical evergreen forest, is a slightly more heavily forested version of zone I. It is dry, thorny and stony. Although called evergreen, during the hot months of March to June all leaves droop and the sun beats mercilessly through. The landscape yellows and browns and has the cast of autumn.

This is characterized by trees with thick evergreen coriaceous leaves, between 30-40 ft. height, forming a complete canopy. The forest is a mixed one with a number of spiny and shrubby species in the second story. Bamboos are mostly absent and grass may be present. . . . It is clearly a degraded form of an evergreen high forest brought into being by the biota. . . . These forests owe their origin to biotic factors and are preserved in the present state as a result of selective felling, lopping, fire, etc. The preponderance of the thorny and unpalatable species is due to grazing, browsing, etc. (Puri 1960:246).

The major species are numerous. They include thorny genera such as the acacias, sirissa, jujubes, spiny *Canthium*, *Werbera*, *Randia*, and cactus; valuable trees such as ebony, rosewood, and sandalwood; and various other trees and plants such as Jamaica switch sorrel, strychnine tree, mountain black plum, clearing-nut tree, soapnut tree, large Bengal currant, whirling nut, *Strobilanthes*, asparagus bushes, and many hard-wooded species of the family *Rubiaceae* (Puff 1960:248; Baliga 1960:158-9).

By my observation a good portion of this son of forest lacks the "complete canopy" referred to by Puri, and there is accelerating illegal exploitation by woodcutters and herders. Many Paliyans dwell in zone II forest, where they find the wild yams (*Dioscorea*) and the wood with which to dig them (*Rubiaceae*) in abundance. *Acacia*, jujubes, *Strychnos*, Bengal currant, sirissa, asparagus, and other genera which they utilize occur in this zone



Zone III (610-1,220meters), moist tropical forest, has sporadic distribution depending on rainfall. It is the wetter equivalent of zone II. Some Paliyans live in this zone. It is a mixture of tropical wet evergreen (Puff 1960:147-50) and tropical moist deciduous forest (Puri 1960:175-84). Because it is so variable and of scattered distribution, no brief summary is attempted. It is of note, however, that this forest occurs in some valleys on the north face of the Palni hills and Paliyans exploit the bamboo, Indian jujube, silk-cotton tree, wild jack fruit, and mango in this zone (Puri 1960:147-50, 175-84). *Dioscorea* has been noted present.

Zone IV (915-1,525meters) is fairly wet but more temperate subtropical forest, the dominant vegetation including mountain black plum, various *Melastomaceae*, and *Lauraceae*. Tamils exploit the economically important *Chichrassia tabularis*, *Canarium strictum*, *Myristica*, and *Acrocarpus fraxinifolia* (Puff 1960:200; Baliga 1960: 158-59). In recent years many Paliyans have migrated to scattered, newly established plantations (oranges, coffee) in this zone and they make trips to it for salable forest produce and herding; otherwise, it is not an area of intense Paliyan habitation. Most Paliyans whom I encountered as high as 1,200 meters gave some particular explanation for being there; in only one group were they engaged in general subsistence foraging. While one still finds wild yams and digging stick woods in zone IV, the main tribal inhabitants are often shifting agriculturalists. In the Paliyan area these would include the Kanikkar, Mudugar, Malasar, and Mannar.

Zone V ( 1,065-1,675 meters), subtropical hill savannah, is characterized by tall grasses, blackwood, button tree, emblic myrobalam, *Wendlandia*, wild olive, sal tree, *Adina cordifolia*, *Lagerstroemia parviflora*, wild date, teak, and shrubby and spiny genera which cattle avoid such as jujubes, conessi, and *Ehretia* (Puri 1960:259-60). The Paliyans ascend to this zone for two reasons. They are among the herders who care for the cattle of plainsmen here during the dry summer months when grazing is difficult in the plains. Their annual burning of these grasses, in fact, may be one factor which leads Puri to call the area biotic and formerly high forest (1960: 259-60). This is also a region in which the Paliyans find the palms utilized for sago. They occur at about 1,200-1,400 meters altitude.

Zone VI (above 1,525 meters), biotic grasslands interspersed with temperate forest (largely rhododendron), is reached by other herders but not by the Paliyans. Temperatures drop to near freezing and life is harsh without proper protection from the damp chill.

Most Paliyans live in the first two zones, in relatively dry, stony, and thorny forest. Its difficult nature has not been brought out with sufficient clarity for, while food is usually abundant, life in the area can be extremely uncomfortable. The upper story is insufficient to give protection from the sun during the hot dry season, potable water is scarce, the thorny understory is extraordinarily thick, and the yams commonly have to be extracted from under or between the granite boulders. Paliyans claim that they alone are able to live with these difficulties and get a living from the forest.

Because the flora of zones I and II is secondary or biotic growth (in the judgement of Puri 1960:246,247), the environment is, by definition, secondary for the Paliyans. There is more than one plausible reason for their living in it. They may have persisted in the area and learned to cope with the degradation as it took place, they may have chosen to retreat to it from a richer area, they may have found it to be a zone in which they could pursue a double economy, and so on. We shall see in the description to follow that gross discomforts notwithstanding, plant and animal resources of the thorn forest allow a sizable margin of safety beyond the level of mere survival. There is no direct competition from below for primary Paliyan resources other than water, pigs, and deer.

Additionally, the thorn forest affords its inhabitants a degree of privacy. Paliyans who live in more luxuriant places are usually still in environments which keep most plains Tamils out--isolated valleys plagued with malaria, or hill areas in which pigs and elephants complicate cultivation and tigers prevent herding. The usual Tamil would rather deal with forestry officials and graze his cattle in naturally safe but governmentally restricted areas than cope with an environment in which the obstacles are not easily overcome.

As noted in the description of zone IV, some Paliyans appear to be hemmed in from above as well as below. Since at least the beginning of the first millennium, several of the intermediate slopes with their good soils have been the home of aggressive shifting cultivators who have periodically left their millet fields to act as mercenaries for the princes of the plains. No evidence was encountered of their being antagonistic toward Paliyans in recent years and, except that they also hunt, they occupy a niche which complements that of the Paliyans.

#### **PALIYAN FORAGING FOR YAMS AND SAGO**

Extracting wild *Dioscorea* yams with hardwood digging sticks is, today, the very basis of Paliyan subsistence foraging. Both sexes dig and cook the yams and the digging stick serves in myth and social reality as a badge of Paliyan ethnic identity. The main tubers consumed are ( 1 ) *vetale vaLLi* or *malai tinu* (a Paliyan taxon which includes both *Dioscorea oppositifolia* and a closely related species with single rather than paired leaves), ( 2 ) *muLLu vaLLi* (*Dioscorea pentaphylla*), and ( 3 ) *nuulam paTai* or *caipam* (*Dioscorea tomentosa*). *Vetale vaLLi* and *nuulam paTai* are found from altitudes of about 1,250 meters down to 300 meters; that is, from the forested flanks and midaltitude plateaus of the mountains down to the very edge of the agricultural plain. The former grows deeply, to 1.8 meters, but has rewardingly large tubers; the latter can be located at convenient, shallow depths. The other plentiful yam, *muLLu vaLLi*, grows mainly on the lowest slopes of the mountains, sometimes fairly deeply. Less common and less utilized are tubers of two more *Dioscorea* yams, two possible *Dioscorea* yams, and *Atrorhophallus campanulatus*; there is use also of *Asparagus racemosus* root (see Appendix A. 1., Edible Roots).

Digging sticks (*kaampu*) are sharpened at one end and stripped of their bark. Most are 90-125 centimeters long, but sticks as short as 25 centimeters are used for digging laterally and one sees occasional examples over 150 centimeters. Bruises from striking rocks and stresses from levering take such a toll on the hardwood points that a single excavation may occasion three or four resharpenings. Lengths at any given time, then, are more a matter of use than of maker's plan. There are male/female differences in manufacture and handling of *kaampu*. Women tend to prepare theirs at home, carrying one to four with them as they go to and from work; men more usually make a single one as they approach the work site and discard it when work is done. Women also lavish greater care on *kaampu* making. After fashioning a good one, a woman may put its point in a fire for two to six minutes, then retouch the tip. As a final step, she may heat even a minor bend in the stick and, using exposed tree knots for leverage, attempt forcibly to straighten it. Eleven digging stick woods were noted (many of which are of family *Rubiaceae*): *iru vaLLi* (*Nelburiya apetala*), *teraaNi*, *navuke* or *irukooli*, and *kaaTTu picci* or *maLLi picci* (*Jasminum augustifolium* or *J. grandiflorum*) are considered the best of these (see Appendix A. 3., Tools for Extracting Plant Foods).[ 2]

A six-week sociometric exercise in 1963 revealed that yam foraging parties have diverse composition and sizes ranging from two to eight or ten. Especially common are nuclear families and groups including husband's mother and son's wife, husband's sister and brother's wife, or sisters. Genealogical composition of two such parties is shown in Figure 4 and the activities of both groups are described below. In general, once the yam beds are reached the quest for tubers begins with individual side trips, 5-6 meters from the trail, in search of their slender vines. The vines of most species rise 2-3 meters vertically into the lower story tree branches before growing laterally. Particularly on the drier mountainsides, whether or not their lower, vertical stems bear leaves, these fairly straight, 3-4 millimeter diameter vines stand out from the tangled forms of the xerophytic trees and bushes. The tubers are exposed by loosening the earth with digging sticks on the down slope side then scooping it away with the hands. Observing or participating in the process one finds, more often than not, that boulders or sheets of exfoliating granite have to be moved; should the butt end of a digging stick be inadequate for doing this, sturdier or longer levers are fashioned on the spot.

In foraging group A (Figure 4), Maari, Paappaa, Kaaliappan, and Lacmi met Moolacci, Kaamaacci, PaLaniamma, and KaNNiamma by prearrangement, half a kilometer from the settlement, and walked together another half kilometer to a yam bed. All but the two-year-old, who rode on her father's hip, began scanning the undergrowth. It was about ten a.m. After a few exploratory side trips the whole group backtracked 100 meters then dispersed, the two older women each working alone, the two nuclear families each working as units. Though out of sight of one another, the various individuals and families all remained within 12-15 meters of the main path and they called out to the others once or twice an hour. There were occasional moves of 10-50 meters. About one p.m., PaLaniamma and the ethnographer collected firewood and began roasting a few tubers. Moolacci joined her son's family for the meal and she stayed to work in the same immediate vicinity as they for the remainder of the day. She dug with a neatness not seen in the work of younger people. She did not go down as deeply, though. When she moved on from one such excavation, her son's wife finished it and extracted quite a bit of tuber for herself. At 2:30, Kaamaacci took his daughter to a river for a drink. This family completed about two-and-a-half more hours of work after their midday meal (leaving seven excavations up to 1 meter in depth within a radius of 5 meters), then they lit another brief cooking fire. Finally, joining up with all the others, they made their way home. Some took time to collect firewood along the way, but the last members of the strung out party were in by five p.m.

Party B had mixed objectives. The two women, aged about 32 and 28, planned a day of foraging for yams and a husband of one (i.e., both women are polyandrous) went out with the intention of both working for a contractor and foraging for his family. A 4 kilometer walk, entailing a 400 meter climb, brought the party to its general work area by 10:15. Everyone took five minutes' rest. The women proceeded a short distance further up the slope; Virappan and I spent the next two-and-a-quarter hours collecting *puLukke* steams and roots, loosening its fragrant bark with smooth, 12-14 centimeter diameter stones, then stripping it off. Once the bark was packed, we searched a boulder strewn stream bed for a water hole where we might drink. Three 1.5 meter diameter pools were found. Although each was heavily strewn with floating matter, water in the third was deemed potable when filtered through cloth. At this point, Virappan, who had been exchanging periodic calls with his wife, received a request from her for help. Guided by coos we ascended slowly to where the two women worked, searching for yam vines and startling a wild pig on the way up. They had exposed, levered up, and propped with stones an 0.75 cubic meter granite boulder in an effort to extract the tubers of two *vetale vaLLi* plants from beneath it. Because the women weighed only about 35 kilograms each, the weight of the boulder and the presence of tree roots up to 10 centimeters in diameter complicated their job. We added our weight to the lever, allowing Lacmi (28), to do the final digging and extraction. Then Lacmi (32) cut a new digging stick and enlisted our help with another such task. Two meters from the first excavation, she had been trying to separate enormous leaves of cracked exfoliating granite, between which two more *vetale vaLLi* vines grew. There was laughter at the small, flattened tubers which she eventually removed. We all took a meal break from about 1:30 to 2:15. The women returned to digging. Napping intermittently between 2:30 and 3:00 p.m., Virappan bundled for delivery to a contractor some bowstring hemp which he had spread out to dry on open rock at few days before. About 4:00 the women set out ahead of us towards home. A kilometer along the trail we found them laughing and poking at holes around a large (3 x 5 meters) waterhole, seeking without success a snake they had seen. One of them unwrapped the top of her sari and the two women swept for fish with it three times across the pool. Sticks were used to scare fish out of crevices along the edge. A 15 centimeter crab was tossed aside, leaving a total catch of 35 (4.9 centimeters) *kal otti miin*. Virappan drank from the pool without filtering the water. Then, while his wife stayed to wash her sari and her hair, he dug a nearby yam (*nuulam paTai*) and Lacmi (28) collected and bundled firewood. At 5:45, after a rest, we set out for home. Lacmi (32), who lacked firewood, picked up occasional pieces with her feet. There was one further stop, to pick and eat fruit and discuss a deer we encountered. We arrived home at 6:45.



Yams are eaten four ways: roasted on an open fire; stone baked (in an earth oven); boiled; and raw. Roasting is most common. During midday work breaks and in the evening, families are seen simply placing yams on flat, open fires, covering them with a few sticks, and leaving them for fifteen to twenty minutes. The scorched surface is knocked or scraped off for young children. Adults may peel their own too if that suits their personal taste and, especially if they have more than can be eaten. Tubers are buried and baked with hot stones for annual root offerings to the protecting gods (they and the gamekeeping gods are known collectively as *caamikal* [the plural of *caami*] or as *vanatcevaataikal*, the latter term translatable literally as "forest deities," Gardner 1991a) and occasionally for ordinary consumption. Many hold that such "stone baked food" (*kat aviya*) is the tastiest. Yams are often boiled, *muLLu vaLLi* being especially good that way. The general preference is to peel boiled tubers after cooking. Finally, the root ends of several species (and fragments knocked off during excavation) may be tender, moist, and tasty enough to be peeled and eaten raw.

Ritual thanks for yams are offered annually, between late November and early January. In one range families do it separately, on days of their own choice; elsewhere it is a communal event. One band ceremony proceeded thus.

Drums were played as the group walked to a the place where yams are plentiful [the site varies from year to year] carrying offerings of fruit, camphor, incense, and ash. After a substantial number of yams had been obtained, half were roasted on an open fire and the remainder stone baked. Later in the day, both batches were heaped together, topped with yam flowers and the other offerings. Several adults threw pieces of root in four directions and asked the *caamis* for protection. While the remaining cooked yams were being distributed to all, one man became possessed by a *caami* who anointed each forehead with yam. Drums were played loudly Once the distributed yams had been consumed, people proceeded home with the drum beat continuing. Part way, four other men were possessed and, at sundown, when the group reached home, three women were also. The *caamis* smeared each forehead with ash and promised their "children" protection for the year from illness and plentiful roots and honey.[ 3]

Sago is a locally available, alternative staple. It grows at 1,200 to 1,400 meters, in temperate subtropical forest and subtropical hill savannah, botanic zones complicated in some ranges by the presence of other peoples. Although Paliyans working near the foot of the mountains are seldom moved to exploit it, they readily list sago among their staples and one 30-year-old woman avers that, at times, it serves as their main food. The species most often exploited appears to be *kunta pane* (sago palm, *Caryota urens*), but there is some indication that the pith is extracted from the trunk of *inci* (a date palm, *Phoenix farinifera*) in the same fashion.

To prepare sago a young palm is cut down, its trunk is split, pith is extracted from the trunk and pounded with heavy sticks. Fibers can be removed from the sago by flushing it with water through a filter. It keeps well if dried and bundled properly. Because a palm contains 10–40 so-called measures of sago (this unit of volume is regionally variable: in the study area 1 measure = ca. 1.5 liters), one tree lasts a family up to one-and-a-half months. Sago is cooked by boiling with water; the paste-like gruel solidifies on cooling and this is eaten with fruit relish.

Subsidiary plant foods which were recorded include roots of wild turmeric, kales, and lotus; stem tips of young bamboo in the northernmost Palyan area; leaves of eight species; five kinds of fungus; also, seasonally, eight kinds of nut and 30 fruits, including wild jack fruit, wood apples, jujubes, and figs. In all, parts of 66 plants are used as food. These are listed in Appendix A and summarized in Table 1.

### PALIYAN HUNTING AND FISHING

In terms of time expended or weight of food contributed, hunting and fishing play a small part in Palyan subsistence. When listing game animals, Paliyans usually begin with their two largest—sambar (*milaa*, *Cervus unicolor niger*, a deer almost the size of an American elk) and wild pig (*panni*, *Sus scrofa cristatus*)—or with those they relish—monitor lizard (they recognize two species of *utumpu*, both *Varanus*), the diminutive chevrotain or mouse deer (*kuuram pann*, *Tragulus meminna*), and the small barking deer (*keelLe maan*, *Muntiacus muntjak*). Data on two bands suggest that they take about three wild pigs a year red, less often, a sambar.

The usual Palyan game includes, in addition, hare, three kinds of rodent, squirrel, giant squirrel, bat, porcupine, three kinds of mongoose, two medium-sized ungulates, pangolin, forest hen and dove and their eggs, quail, partridge, young of two large birds, eight other birds, tortoise and its eggs, and fourteen freshwater fish (detailed in Appendix B and summarized in Table 2). There are several other animals which, for various reasons, are eaten only occasionally or by only a few people: Swiftness of the Nilgiri tahr, a wild goat, leads Paliyans to say that its pursuit is impractical under normal conditions; bonnet macaque, Nilgiri and common langur, and slender loris are regarded by many as improper food (the protecting gods have announced certain such prohibitions, but tales indicating that these primates once were human—as also the bear and the elephant—may play a part in the fairly widespread avoidance); finally, flesh of marten, otter, and the common palm civet is judged too unpalatable for any but the needy. Some species are accepted by all as forbidden; for instance, gaur bison, tiger, bear, elephant, and all snakes. The newborn of sambar, pig, chevrotain, giant squirrel, and langur are eaten for medicinal as well as subsistence purposes. If fetuses of large mammals are deemed to be edible but not tasty; they are usually given to the Palyan dogs. When a lactating sambar doe is killed, an incision is made in the udder and the milk expressed. It is consumed fresh.

Composition of cooperative hunting and fishing parties depends on the prey, band size, and personal choices. Here are four examples. (a) When a call goes up that tracks of an injured pig or sambar have been found, all who elect to participate join in. In the largest settlements, at forest's edge, such a party is likely to be made up of four to ten men—half in their twenties, the remainder between 30 and 45. (b) In smaller Palyan bands, there is a regular way by means of which two or three married couples with dogs can ambush sambar. A 30-year-old woman described the technique thus: "We accompany the men for the hunt. Taking the dogs, the men chase the *milaa*. We know in what direction the dogs are chasing the *milaa* and sit in hiding when it comes our side. When it passes us we cut its leg. Then it falls down and, at once, we kill it with big stones." (c) Men and women also join forces in the pursuit of mole-rats; a large party is needed to cut off their escape and members of both sexes participate in all aspects of the work, guarding escape routes and digging. (d) Finally, in addition to family groups which do this, same-sex parties of two to four people from different families may net fish together in a cotton cloth.

A cooperatively taken sambar, pig, or batch of fish is divided among all participants. Except for the gift of a double share to the person making the first hit on a large, dangerous animal, the shares are meticulously equal. Butchering entails dicing the animal. Meat is portioned out onto large leaves so that each share contains side, leg, and so on. Brain and liver are divided up similarly and skewered. All participants review the division and adjustments may be suggested. When all finally agree that the shares are equal in size and composition, people take whichever share is within convenient reach. A fishing party of three was able, without cutting any of the fish, to agree on a fair way of dividing up a catch of four medium-sized fish and some twenty small ones. Bird-David (1990:192) has described similar meat division among Nayaka.

As noted earlier, individually taken small game is eaten privately and is little discussed, even when an individual catches small game while out with others on a cooperative hunt. In one such instance, a man with the help of his dog took a mouse deer in the course of a pig hunt. Others watched and commented on the capture but, once the game was tucked away, no more was said of this private prize.

Hunting equipment consists mainly of small dogs, spears (a few men have access to borrowed *paala kaampu*, spears usually bearing metal points, to be thrust or thrown) and sharpened sticks, billhooks (the *aruval* is a machete-like general implement of the region), stones, fire, and thorn bushes. Given a sufficiently large hunting party, injured and tired pigs or sambar can sometimes be surrounded. In one such action, three of the nine participants, had spears, others had billhooks, and the two small dogs which had helped with tracking stayed back out of the way until the hunters rushed in on the pig and dispatched it. Dogs are also used to drive large game into ambush and to bring down small terrestrial game. Stones of three kinds are utilized: in addition to the large stones Paliyans use in killing sambar, small stones are thrown at birds and small mammals to stun them, and sheets of exfoliating granite are propped and baited to form deadfall traps which are triggered either by the game (e.g., Galliformes such as fowl, partridge, and quail) or remotely with string by their makers. Both these kinds of deadfall are used by the south Indian Kurumba, too (W. A. Noble pers. com.). Fire is employed for driving monitor lizards or small deer out of rock crevices and for bringing down bats. Finally, older children are able to defeat the sonar of bats by swatting them from behind with thorn bushes.

An important aspect of the hunt is use of a special set of inoffensive, figurative terms for the prey when one is within earshot of them. Animals hearing their true names are said to become ashamed and run off to hide. One man explained that it is animals caught by hand toward which one must be respectful. Most of the respectful terms which could be elicited were indeed those of food species (see Appendix B in which respectful generic and specific terms are listed, marked R), four exceptions being the two useful predators discussed below, plus elephant (*otte kaiyaam* "single handed") and sloth bear (*veLLe mukkan* "brightened nose," or *paacaliyom*).

The two large game animals (pigs especially) are said to be difficult to hunt without the aid of the gods, but the gods tell people in which direction to hunt for them and send predators (particularly giant tigers and wild red dogs) to injure them where Paliyans will find the spoor (see Gardner 1991a). Killing these large animals is marked by special ceremonies, the rites being unnecessary if the animals are already dead when found. Immediately after the kill, the sambar or pig is moved to a sufficiently open spot. Forming a ring about their take and leaning blood smeared weapons on it, the hunters raise their hands, palms joined, in common prayer (*kompuTu*) to one or more of the gamekeeping gods. Wording of the prayers varies considerably. Always, though, thanks are coupled with requests for the future, thus: "You have given us a good hunt. Care for us similarly always." "We thank you. Help us. Give us many such hunts?" In the case of a sambar, one member of the party then takes blood with cupped hands and throws it up. Following one pig hunt a second ceremony was performed, part way home, where we stopped to do the butchering. The spears and a billhook used in the hunt were laid out on the ground at the butchering site together with a leaf containing a piece of meat from each share and four of the skewers of internal organs. Thanks were extended to the same *caami* addressed at the end of the hunt and the leaf of ritually offered meat was placed atop a thatched tool that evening in the settlement.

Fishing is done year round by both sexes. If the boulders of a stream bed can be positioned so as to create one main channel through a shallow rapid, a simple men's cloth suspended from four poles suffices to net migrating runs of fish in January. The cloth will be emptied every few minutes and hundreds of 5–8 centimeter fish caught in a matter of hours. Fish can also be found by hand in holes and crevices. In a water hole or still pond, two or three people can sweep once or twice with a hand-held cloth or they can employ poison. Three poisoning techniques are in common use, one of which entails mixing the poison with a catalyst (see Appendix B. 7.).



Products of hunting and fishing are prepared in diverse ways. Most meat is boiled alone or with vegetables in water. Tortoise and bird eggs are also boiled. When one is away from camp large animals can be roasted, for convenience. Sambar liver is always roasted, and for rats and squirrels, a few minutes on the coals may suffice. If appropriate vessels are available and if it is plentiful, pig fat is rendered and saved for later use in cooking. Brains of large animals are fried in oil. Finally, the half-digested food in the langur intestine is mixed with water, filtered, and then drunk.

Flesh is not always fresh. Unusually bountiful catches of small (5-7centimeter) fish are left out in the sun to dry for a day, with dead thorn bushes covering them to keep off scavengers. Cleaning is deemed unnecessary. They will be cooked lightly, but can be quite high when eaten. If there is extra meat from a hunt it, too, can be dried. Palyans offered descriptions of meat being rubbed with preservatives (salt, turmeric, and chilies), sun dried., and kept for weeks; however this technique was never seen in actual use. On one occasion I was served cooked but fetid carrion pork which had been found after it had lain in the heat for about three days.

#### **PALIYAN HONEY COLLECTING**

Honey is collected from the four types of honey producing bee found in the region (see Appendix B. 1.). It is easy to raid the food storage cells of the tiny koocun (*Melipona*), with its almost imperceptible sting. However, the prize for chopping open its tree is no more than a morsel, to be consumed on the spot. If they can be found in the foliage, the small single combs of cukki (*Apis florea*) are even more easily taken. Merely shaking the tree limb or ascending the tree with a pungent handful of crushed taraku grass is enough to displace the bees, which then hover a meter or two above the comb; it is usual for the supporting twig to be severed and the comb retrieved without incident. The yield is 30-120 grams of honey so light and delicate it has a special market value Palyans relish drinking it during work breaks. The pontan (Eastern honeybee *Apis cerana*) protects its honey from humans more effectively than the small bees, but the size of its multilayered combs justifies the effort and risk of extracting them from tree hollows and crevices. Smoke protects the gatherer during enlargement of the hole. There is risk of stings, nonetheless, when reaching one's hand in to extract the combs The honey gatherer's real prize, if it can be reached, is the enormous single comb of the kaTante (*Apis dorsata*), which may hold 14-18 kilograms of honey. Its location (beneath cliff overhangs or heavy upper tree branches) and its makers' aggressiveness are formidable obstacles to obtaining it. yet they are usually not insurmountable. Palyans make flexible vine ladders for descending cliffs and rigid wooden or bamboo ladders for ascending the massive trees these bees inhabit. They also have techniques for avoiding stings.

Men collect honey considerably more often than women (especially where work parties are put together by honey contractors), but both, sexes are involved in taking all four kinds. When dealing with the three small kinds of bee it is usual for people to work alone; in the case of the kaTante people work in cooperative groups of up to six. To take honey from a kaTante cliff comb a flexible ladder must be constructed. It will always be made anew. Four species of vine are suited to the purpose (see Appendix B. 7.). The long strands needed for the main support rope are made by fastening two or three vines together end to end, with knots broadly similar to sheet bends (see Figure 5a). Three such long strands are twisted together for safety. Other vines, nearly 4 meters in length, are fashioned into substantial, three-strand rung loops about 40 centimeters in diameter by looping the vines on themselves three times and twisting each new loop about the preceding ones for strength. The finished rungs and main support rope are interlocked (see Figure 5b) and lashed to each other with small vines. Once the ladder has been attached firmly to a tree or rock and someone has volunteered to descend it, a person the climber trusts will be asked to tend the ladder. (Palyans say formulaically that this should not be a brother, a potential rival for women, but should be a father-in-law or brother-in-law; actual teams are often as prescribed and seldom do include brothers.) Two things are done for protection. The climber descends at night, when the bees are less prone to stinging, and either chews eerankaiyum (wild onion) to blow at the bees—which some Palyans call an outsider's technique—or slings on a vine from the shoulder a smudge of dry grass wrapped in fresh leaves. A container is lowered from above. When the bees have been driven away, before the honey is touched, a bamboo stick is inserted and honey is spilled or thrown in four directions to thank the vanateevaataikaL, or forest deities (those addressed appear to be a particular pair of gamekeeping gods, KuuTaaratammaa and KuuTaarataaNTavan, who are named. metaphorically for honey combs). Then, part of the comb is broken off by hand or by thrusting the bamboo at it, or the stick is used to make the honey flow. A pole ladder of up to 5 meters in height may be employed to reach the climbable branches of a kaTante honey tree. Its crosspieces are attached with vines and, as the climber ascends, the bottom then the middle and top of the ladder are secured to the tree with vines. If wooden or bamboo poles are unavailable, steps may be cut in the tree. Again there is a single climber. No-matter what their roles in a honey collecting party, all members get equal shares.

#### **RESORT IN TIMES OF SCARCITY**

Most Palyans live in a rainshadow area. Although drought affects yam growth and renders digging difficult, damper soil above 900 meters somewhat eases the task during dry spells. What is more, because the upper yam beds are least heavily exploited in some ranges, they constitute a reserve. My main fieldwork followed a succession of years dry enough to distress the Palyans' agricultural neighbors. Even so, the lower yam beds were deemed still adequate for daily foraging by most families in each of the groups with which I spent much time. Only a few yam diggers were climbing to the wetter zones. People complained regularly to their protecting gods about the baked earth and prayed earnestly for rain, but they saw no need to take emergency measures.

My main study group views the lower yam beds as their principal food supply. They fall back on higher elevation yams during drought, these and the sago just above them being available without much movement. When usual food or water supplies fail them, depending on the prospects, they take recourse either to migration or to use of emergency foods (in particular, two leaves, a berry, beeswax, and juice of a vine). In short, people turn to alternatives in an orderly way, comparable to what medical anthropologists have come to call a hierarchy of resort (Romanucci Schwartz 1969).

#### **FORAGING IN CONTEXT**

Palyans oscillate between life in a culture contact (or frontier) zone and more isolated existence away from the frontier—between a mixed economy of foraging and work for others in the frontier and a foraging economy away from it (Gardner 1985). For the forest-produce contractors, honey contractors, and individuals who seek their help with one-time needs, Palyans were found to be collecting fourteen foods (including spices and pickling agents but not meat; Palyans who have sago on hand may also be asked to trade small amounts), three ingredients of incense, eight toiletries, thirteen medicines, six construction materials, and fourteen other diverse items. Some Palyans also take occasional one-day jobs with the forestry department, to conduct placatory rituals to the sandalwood goddess and to help in other ways in the extraction of sandalwood and two other precious woods. Some work as laborers and one or two work as foremen in fruit plantations near the forest. The Palyans' practice of walking away from conflict makes them unreliable in the eyes of plantation managers, and this is used to rationalize their being paid less than their Tamil coworkers. In a few groups Palyans do seasonal field labor; plowing, transplanting rice, weeding, watching ripening rice fields along the forest's edge to keep wild pigs out, and harvesting. There are odd cases of them herding cattle for outsiders seasonally. From time to time one will accompany Tamil hunters on nightlong outings. Finally, there are instances of them guiding pilgrims, officiating in Hindu forest temples, and doing watch duty at temples or shrines (Gardner 1982). Of course, each of these kinds of work is subject to regional availability. Their pay for the more regular jobs is generally either in cash or a daily allotment of low-grade husked rice, with clothing being given annually at festivals. Tools such as billhooks are made available grudgingly as needed. Adults were receiving Rs. 0.75 to 1.25 per day (and a 12 year old Rs. 15 per month for plowing) in 1963. Supplemental pay commonly includes betel leaf, tobacco, condiments, and, in one plantation, soap.

The calendar in Figure 6 shouts that those Palyans with the right mix of active forest produce contractors and other employers available could work year-round for outsiders. Preferences help shape the choices. On the part of the employers, there is a bias toward workers under 40 and, for all but certain kinds of agricultural labor, a bias toward males. On the part of Palyans, personal preferences as to both diet (some find yams tastier and more easily cooked than rice) and working conditions help shape the decisions; a few have the requisite interest and opportunity to rely on work for outsiders, some ignore most or all of the external opportunities, and the majority opt for a mix.

Nine months of research on one Palyan group, plus interviews with their employers, yielded a fairly clear picture of the overall economy. Let it be noted however that of the ten Palyan groups from which I obtained subsistence data, this group had the second best set of employment opportunities. Data were obtained for 21 out of 23 men and for all sixteen women. Nine men were almost solely plantation workers (one as a foreman) or contract laborers, doing only occasional foraging; seven men did plantation or contract labor much of the year with occasional foraging during those times and pure foraging during a two to four month off-season; five men and five women did some seasonal contract labor, but relied for a greater part of the year upon foraging; four women did only occasional contract labor, relying almost solely on foraging; and seven women simply foraged.

Household patterns bear description. (a) Six households were composed of men who did only occasional foraging and women who were mostly, almost solely, or solely foragers.[ 4] (b) Six households were composed of men who relied seasonally on foraging and women who were mostly, almost solely, or solely foragers.[ 5] (c) Three households were of men who foraged most of the year and women who foraged most or all of the time. Additionally, there were four single men, two of whom did only occasional foraging, one of whom foraged seasonally, and one of whom foraged most of the time. In a representative family, while in the frontier, the husband has a seasonal cycle of foraging and work for outsiders and the wife forages on a more regular basis, entering employment at peak seasons if at all. Commonly one sees spouses go to work together, as in foraging party B (Figure 4), he to collect for a forest contractor and she to dig yams in the same vicinity. They keep in touch, coordinate breaks, and perhaps with another couple or two, hunt or fish briefly on their way home. We must remember that individuals, families, and bands may give up these patterns and adopt elusive, full-time foraging away from the frontier for weeks, months, or even years when feeling threatened. One such band I worked with had been away from employment for about five years. At the time of the study they were inching back into contact, but remained nomadic in order to avoid encounters with a violent contractor.

An increasingly popular term for South and Southeast Asian foragers is Selgmann and Selgmann's (1911:40) "professional primitives." It is, after all, well established that those who hunt and gather in this part of the world are affected in diverse ways by their long-term encavement and close ties with food-producing peoples. Parker (1909), Kroeber (1919), Bose (1956), and Morris (1977,1982) have presented particular cases in such a light, while Miller and Dollard (1941), Kroeber (1945), Service (1962), Allchin (1966), Gardner (1965,1966,1985,1991b), Fox (1969), Williams (1974), Peterson (1978a, 1978b), Hoffman (1984), Rambo (1985), Headland (1987), Bird-David (1988,1990), Dentan (1988), Sandbukt (1988), Headland and Reid (1989), Bailey et al. (1989), amongst others, have either generalized about the phenomenon or combined case studies with generalizations.

Unfortunately, the diversity of the effects of this encavement has been neglected. In recent discussions of the interaction of foragers with their neighbors we have done altogether too little to examine or analyze the varied and separate effects of (a) the interaction per se, including such things as sociopolitical domination; (b) disruptions due to epidemics of new diseases, displacement, involvement in exchange (of wild products for implements, domesticated foods, or cash), and so on; and (c) development of actual dependence upon neighbors.



Compounding the problem of diverse effects is a tendency to treat theories about some of them as if they were reliable, factual research findings. That is precisely what is happening with Fox's (1969) theory. Two of its component ideas—that collecting by Indian foragers is "highly specialized" because it is "primarily for external barter or trade" and that their "economic process and well-being are dependent on the barter" (1969:141)—are being treated (e.g., by Bailey et al. 1989) as if they are empirically established and generalizable. Although Fox's arguments are cogent, although he echoes Kroeber as regards the matter of dependence, and although Rainbo (1985:31) offers parallel assertions about Southeast Asian foragers (e.g.: "it is doubtful that they could survive if trade were cut off"), key elements of Fox's theory are still awaiting a test.

#### THEORY TESTING WITH SOUTH INDIAN DATA

As should be apparent by now, Palyan ethnography permits a preliminary assessment of certain aspects of Fox's theory. We also have information on the Malapandaram (Morris 1977, 1982) who live immediately to the south and west of Palyans, with rather similar ways of subsisting and of managing their two-sided economy. And, because Fox (1969: 140) asks whether Indian foragers are different in economic and social structure from those of Australia and the New World, data on dry habitat foragers from these two continents and Africa will be brought into the discussion.

Several things must be said about the materials. First, the plant and animal inventories of Palyans and others are given in terms of the most specific indigenous biological taxa, but most correspond closely to scientific species. Second, neither the Palyan nor the Malapandaram materials constitute memory culture. Our records are to an appreciable extent observational. Apart from the emergency foods, resort to which appears to have been temporarily unnecessary, no general category of food plants or animals was going unexploited at the time of my Palyan field work. Third, although Monrrie (1982) has not given a full species list of subsistence plant foods, his review of animal foods and his overall discussion of wild food extraction and use parallel my own closely. Except for twentieth century Malapandaram adoption of firearms, only minor differences are in evidence.

One assertion about Indian foragers is, "The particular kind of hunting and gathering they do is not a complete utilization of all resources for subsistence provided by the environment, but rather a selective exploitation aimed at the gathering of materials which are exchangeable or saleable to their agricultural neighbors" (Fox 1969:154). If true, then a small list of wild subsistence foods, a nutritionally incomplete list, and an inventory of wild resources skewed toward items of trade would be evident. I have compared the size of the Palyan inventory of wild species utilized with that of four other dry habitat foragers.[ 6] Although such comparison across environments has limited meaning, the painstaking work of the Kalahari Research Group (Lee 1979:466-476), Chamberlin (1908,1911), the Santa Fe Laboratory of Anthropology (Ray 1963), and Meggitt (1962) permits asking whether Palyans are categorically different from !Kung, Gosiute, Modoc, and Walbiri. Tables 3 and 4 show that !Kung exploit 151 plants and 27 animals for their own use, Gosiute 141 plants and 26 animals, Modoc 112 plants and about 55 animals, Walbiri 74 plants and 105 animals, and Palyans 178 plants and 70 animals. Their respective subsistence food lists are !Kung 130 species, Gosiute 112, Modoc ca. 130, Walbiri 140, and Palyans 128. The size per se of the Palyan list is not indicative of what Fox calls "selective exploitation."

As regards breadth and sufficiency, the make-up of the Palyan wild food inventory is telling (Tables 1 and 2). They utilize fifteen roots and bulbs, two trunks and stems, eight leaves, 30 fruits and berries, eight seeds and nuts, five funguses, a resin, honey, and proteins and fats from 58 diverse vertebrates. Given year-round availability of yams, stems, leaves., and game, the Palyans' foraged diet is not obviously lacking in basic nutrients,

But, what of the anticipated bias toward extraction of exchangeable items? Table 5 provides an answer. Of 274 plants and animals (or their products) which Palyans collect, 216 are acquired solely for their own use, 32 are collected for both trade and Palyan use, and 26 are collected purely for trade. The percentages are: own use 78.8 per cent, both 11.7 per cent, and trade 9.5 per cent. There is no evidence of a skew of the magnitude Fox (1969) predicted.

#### DISCUSSION AND CONCLUSIONS

Although most Palyans reside near the edge of the forest as Fox (1969:141) would expect, although they have: almost certainly extracted and traded forest produce for centuries (Gardner 1965, 1985; Morris 1982), although they have discontinued use of bark cloth, although all families possess at least one metal cutting implement, and although Palyan groups all eventually cycle back into economic contact with Indian society after flight from problems, Fox's (1969) theory greatly understates the extent to which Palyans can and do depend on wild foods. Foraging offers not a truncated or barely remembered way of living, but a rich, ongoing set of practices.

Palyans are linked with the forest in symbolic ways, too. They call themselves "forest people?" They retreat into the forest immediately when ill. They have two sets of what they call forest gods who figure in their daily life, one the set of protecting gods or spirits who visit regularly through shamans, the other an elegantly structured set of gamekeepers who tend the bees and animals and send the Palyans gifts of prey (Gardner 1991a).

While we are indebted to Parker, Kroeber, and others for our seeing Asian foragers in context, it also is important to appreciate with Bird-David (1988:19) that theories which have supplanted the so-called isolationist position often equal it in their oversimplification. Close examination of foraging data from south India reveals that although commercial extraction of forest goods is important to Palyans, Malapandaram, and others, there are rich possibilities for subsisting by gathering, hunting, and fishing. People such as the Palyans not only have the resources and the competence to subsist off the forest, many including the young actually do so, and they do it regularly and for protracted periods of time.

## APPENDIX A: PLANT FOODS AND THEIR EXTRACTION

For those plant species given definite or provisional identification by Br. Arochiasami, specimen numbers (prefixed with BA) follow the scientific names. Additional, comparative information on the terms in Appendices A and B has been derived mainly from four dictionaries and three manuals: Burrow and Emeneau A Dravidian Etymological Dictionary (1961) [data from which are identified below simply by Burrow and Emeneau's entry numbers]; Emeneau and Burrow Dravidian Borrowings from Indo-Aryan (1962) [identified by EB and the entry numbers]; LIFCO Tamil-Tamil-Aankia Akaraati (Tamil-Tamil-English Dictionary) (1968) [identified by LT]; LIFCO The Great LIFCO Dictionary: English-English-Tamil (1962) [identified by LE]; Gamble Flora of the Presidency of Madras (1957) [identified by G]; Prater The Book of Indian Animals (1971) [identified by P]; and Watt The Commercial Products of India (1908) [identified by W]. Fyson's illustrations in The Flora of the South Indian Hill Stations (1932) have also been useful in checking identifications. The comparative remarks in the appendices are, in general, abbreviated quotations and they pertain to Tamil unless otherwise specified. Rarely used variants of terms are given in parentheses; contracted and other derived variants are indicated by >.

### A. 1. EDIBLE ROOTS

all lotus (root; from irrigation tanks, outside the forest) [Nymphaea lotus]

ceene an aroid [Amorphophallus campanulatus] [G cf., Malayalam mulenceena Amorphophallus campanulatus; ceena Amorphophallus dubius]

cee vaLLi "darkish creeper," a yam [Dioscorea] [4351 vaLLi climber, creeper]

kaamala vaLLi "lightish creeper," a yam with horizontal, radiating tubers [Dioscorea BA 3; probably D. belophylla] [LT kaamaalai jaundice]

karu vaLLi "scorched/darkened creeper," a yam [probably Dioscorea]

koolan koove a creeper (root) [probably Bryonia epigaea] (differs from koove, below) [cf., 1553 kuuva East Indian arrowroot, Curcuma augustifolia]

malai ceempan keLunku Indian kales [Colocasia antiquorum] [ 1314 kiRanku esculent or bulbous root]

manca keLunku turineric (root) [Curcuma longa] [LT mancaL turmeric plant]

muLLu vaLLi, (muLLa keLunku) "thorn creeper," "thorn root," one of three staple yams [Dioscorea pentaphylla BA 1]

nanaari veer, raaman nanaari, (nanaali), (nalaani) a twining shrub (the root in water quenches thirst) [Hemidesmus indicus BA 17]

nir vaLLi, nir muTTam keLunku "water creeper." "water trunk root," asparagus (root) [Asparagus racemosus BA 11] [3057 nir water, sea, juice; 4039 muTTam trunk, log of wood]

nuulam paTai > nuulam, caipam "thread multitude," one of three staple yams (sticky threads connect the pieces when it is broken; it is only eaten by southern Palyans) [Dioscorea tomentosa BA 2] [3087 nuul yam, cotton thread, string; 3195 paTai army, crowd. Kannada paDe multitude, host, force, army]

nuuram keLunku > nuuruti "powder root" (a root which is heated then pulverized; found to west and south of study area) (possibly Dioscorea) [3089 nuuru to crush, pulverize, reduce to powder, . . . n. powder, dust, flour]

puLLe vaLLi "child creeper," a yam (west of range only) [probably Dioscorea]

vettale vaLLi > vetale vaLLi > vaLLi, malai tinu "betel creeper > creeper," "mountain food," one of three staple yams [the Palyan taxon includes both Dioscorea oppositifolia and a Dioscorea species which is similar, but which has single rather than paired leaves BA 4, BA 5]



## A. 2. OTHER FOOD PLANTS

aaccam paLam, acaari a mulberry-like tree (fruit) [Guazuma tomentosa BA 19] [3299 paRam ripe fruit]

aaTlaan kuTTe Malabar nut [289 aaTaatoTai Malabar-nut, Justicia adhatoda; Malayalam aaTaloTakam Justicia adhatoda or bivalvis; 1722 koTTai seed of any kind not enclosed in chaff" or husk, nut, stone, kernel]

ampu kaaLam a mushroom [LT kaaLaan fungus plant like mold or mushroom]

atti maram kaaLam fig tree tungus atti paLam, kalicci p., vaLuka p. fig (fruit) [Ficus bengalensis BA 24]

carpa tnaLaka chili (wild or feral plants are found) [3986 miLaku black pepper, Piper nigrum]

campa viire paLam (fruit)

cem murukom kuTTe > cernurukan kuTTe possibly palas tree nut [i.e., Butea frondosa] (only the interior of the fried seed is edible)

cuumaale koTi, paavaTTam k. a vine (leaf, eaten raw) [1705 koTi creeper]

cuure a jujube (fruit) [Zizyphus oenopia BA 18] [2253 cuurai oblique-leaved jujube, Zizyphus oenopia]

elante paLam Indian jujube (fruit) [402 ilantai Zizyphus jujuba]

INTu mimosa (tender leaves are an emergency food) [Acacia intsia caesia]

kaaram kooTTai (nut) kaaram paLam fruit of a large tree

kaLLi maram kaaLam a tree fungus

kaNNi kai, veLLai koTi kai berry of a low tree [ 1220 kaay unripe fruit]

kiLaa paLam (> kiLe p.), k. kai a large currant (eaten ripe and unripe) [Carissa carandas BA 22] [1161 kaLaa large Bengal currant, Carissa carandas]

koonka maram kaaLam a tree fungus koovee, koovampalam, koovankiire a creeper (fruit and leaf) [ Cephalandra indica = Coccinea indica BA 14] [1345 kiirai greens, pot-herbs]

kooya hill guava bush (fruit) [Rhodomyrtus tomentosa] koTi nava paLam small sweet fruit of a bush

kumaTTi kiire (> kuumaTi) leaf of a spreading plant with bitter, spherical fruit [Cucurbitaceae] [cf., 1455 kummaTTi, kommaTTi a small water melon, Citrullus; cucumber, Cucumis trigonus]

kunta pane: sago palm (pulp from the trunk of a young tree used for sago; found everywhere on upper Peymalai slopes) [Caryota urens BA 32] [cf., 3324 panai palmyra palm, Borassus flabellifer]

kurute koLampu kai koTTe horse heel fruit and nut

kuuttu puLici, puluncan paLam fruit of a widespread vine

lavanka paLam fruit of a tree [possibly the relatively large fruit of Cinnamomum macrocarpum [LT ilavankam cinnamon tree]

malai inci, inci mountain date palm (fruit, eaten and soaked in water to produce a drink) [Phoenix fariniferu] 459 incu date-palm; dwarf wild date-palm]

mampaLam wild mango (fruit) [Mangifera indica BA 33]

more koTi a vine (juice of the vine is an emergency water source)

muLLu kiire > muLLe k., (katu kiire), (munne k.) thorn leaf (the leaf is an emergency food) [Amarantus spinosus BA 26]

muLLu kooTTam kai, (naa kooTTam) a jujube nut [Zizyphus trinervea BA 20]

muLLu maile a small thorn tree (fruit)

muluke takaali (leaf)

murunkai kiire > murunke k. horseradish tree leaf (and fruit) [Moringa oleifera BA 34]

muunki bamboo (young stems eaten) [Bambusa species]

neTu naare paLam (fruit) [Polyalthia coffexoides BA 35]

nuule paalai paLam (fruit)

oolava maram kaaLam a tree fungus

paLam paaci "fruit hunger," from a small bush (berry) [3165 paci hunger]

panne kiire (leaf)

peey atti fig [Ficus]

pilaa paLam jackfruit [Artocarpus integrifolia] [3290 pilaa jack-tree]

pilaa parappu wild jackfruit nuts [Artocarpus pubescens]

puluncan paLam fruit of a widespread vine; same as kuuttu puLici

taalam kooTTai (nut)

teeva kooTi paLam (fruit)

tootakatti paLam fig [Ficus]

uTuppe paLam > uTupe paLam (fruit)

vaNTaaLam kooTTai > v. koTTe (> vaNTaLam kuTTe) (nut)

veLa paLam wood apple fruit [4535 viLaa wood-apple, Feronia elephantum] viracu sebesten (berry) (not the same tree as the virucam or ti viracu, Quercus ilex, used for fire making) [4435 virucu large sebesten . . . Cordia sebestena]

### A. 3. TOOLS FOR EXTRACTING PLANT FOODS

kaampu digging stick; sturdy pole, stick, or branch [1216 kaampu handle, shaft, haft]

aTu tinni maram, (aTulam) (digging stick wood)

iru vaLLi, (> tiruLLi), culutan kaampu (good digging stick wood) [Nlebhuria apetala BA 40]

kaaTTu picci, (kaTTupicci), (maLLi picci) forest jasmine (a very strong digging stick wood) [Jasminum augustifolium or J. grandiflorum] [3406 picci large-flowered jasmine; 119 atiral wild jasmine, kaaTTu-malikai (= Jasminum augustifolium)]

kurunca (kaampu) a small hardwood tree (digging stick wood) [probably Atalantia spp.] [G kuruntu Atalantia missionis]

kuuTTe peraa maram "dove head tree" (digging stick wood) [Streblus BA 41] [3555 puraa dove]

navuke, irukooli (good digging stick wood) [possibly Rubiaceae]

neekkiyaTTom, neekkooTTom, cenkoTTe (possible alternative digging stick wood) [1668 ceen-koTTai marking nut tree, Semecarpus anacardium]

paavaTTe, (paavaTam) (digging stick wood) [Pavetta breviflora BA 12]

peTa, peTan, (piTaam) (digging stick wood) [Rubiaceae]

teraaNi, (teraNi) (good digging stick wood) [Rubiaceae]

veLLi irukooli (digging stick wood) [Rubiaceae, probably Werbera BA 8]

### APPENDIX B: ANIMAL FOODS AND THEIR EXTRACTION

("respectful" generic and specific terms are marked R)

#### B. 1. HONEY

muLuku wax (honeycomb by itself is an emergency food) [4169 meRuku wax, gum]

teen honey [LT teen honey]

teen ii "honey insect," bee [453 ii fly, bee; teen-ii honey bee] cukki, cukki teen the 8 millimeter long Little honeybee (it uilds 8-25 centimeter diameter single combs beneath small tree branches) [Apisfloreas]; the honey is variously called kompu teen, kompan t., kucci t. (> kuucci t.), "branch/twig honey" [1759 kompu branch; LE kucci twig, a small thin branch]

kaTante the dark, 18 millimeter long Giant honeybee (its single combs, up to 150 centimeters wide and 90 centimeters long, are hung from cliffs or heavy tree branches) lapis dorsata] [cf., 938 kaTampai a kind of homet; Kodagu kadandi wasp]; its honey is called kaTante teen or malanteen [3882 malai hill, mountain]

koocun a 3.5 millimeter long "stingless" bee (it nests and builds food storage cells in holes in trees) [Melipona iridipennis] [1736 kocu mosquito, gnat, fly]; its honey is called koocun teen or koocu teen

pontan "hole bee," the 12 millimeter long Eastern honeybee (it makes combs with several layers in hollow trees or other protective cavities) [Apis cerana = A. indica] [3646 pontu hole, hollow]; its honey is known as pontan teen, aTaku t., or toTan t. 156 aTakku to , , , hide, conceal; 2927 toTu to dig, scoop out, excavate]

#### B. 2. FISH

aara a fish

ayire, aiyire loach, a small fish [ 160 ayirai loach . . Cobitio thermalis]

cileepi a fish [? 2292 cellal freshwater fish, Etrophus maculatus]

cootta vaalLai > cotevaalLai a fish [764 eeri-vaalLai a freshwater fish, Wallago attu]

kal otti miin a small black fish [3999 miin fish]

kelure a fish

keLuti a valued, medium sized fish

keNTe a valued fish [ 1620 keNTai a freshwater fish, Barbus]

koravai, korave naTu miin, naTu miin black murrel, a large fish [1531 kuravai black murrel, Ophiocephalus ,striatus; O. punctatus]

pulaavaTi a large fish, possibly carp

uLaval a large fish with eyes atop head [597 uRuvai (two freshwater species of Gobius)]

veLanku a fish veliru, veliccu a fish vital > viraa a large fish

#### B. 3. REPTILES

aame tortoise (unlaid eggs are also eaten) [4232 aamai turtle, tortoise]

uTumpu monitor lizard [509 uTumpu iguana (sic), Varanus bengalensis]; R mancam "light hued," R vaal puucci "tail insect" [4394 vaal tail, anything long; 3570 puucci insect, beetle, worm] malankaari uTumpu (dark hued, found in mountains) nat uTumpu (light, found at lower elevations)

#### B. 4. BIRDS

cittu kurivi sparrow

kaatai rain quail [ 1208 kaaTai rain quail, Turnix taigoor]

kaTTu kooli (> kooli) > k. kooli (> kattu k.) forest hen, possibly grey jungle fowl (eggs are also eaten and fowl are kept as pets) [? Gallus sonneratii] [LT kooRi domestic fowl]

kautaaari partridge [Francolinus] [LT kavutaari partridge; kautaaari id.]

konna kurivi unidentified



kuuke horned owl (young eaten; for it to fly across one's path portends danger) [1552 kuukai rock horned owl, *Bubo bengalensis*]

kuyil cuckoo (and kept as a pet) [1470 kuyil Indian cuckoo, *Eudynamis honorara*]

maram kotti goldenbacked woodpecker (its cry announces death) [*Dinopium benghalense*] [ 1740 kotti grubbing, mincing, pecking]

mayil peacock [*Pavo cristatus*] [3793 mayil peacock]

peraa, puraa dove (eggs are also eaten and doves are kept as pets) [3555 puraa, pura dove pigeon]

tenkootti an unidentified large bird

## B. 5. MAMMALS

aaNi squirrel (young kept as pets; some hold that for a small squirrel to cross one's path foreshadows danger) [*Funambulus* spp.] [1911 aNi, aNiṁ squirrel]

aLunku pangolin, scaly anteater (and its scales burned with kuunkaliyom expel spirits from house) [*Manis crassicaudata*] [243 aRunku pangolin, Indian scaly ant-eater]; R cuumaaTan "rolled pad," the circular pad of rolled cloth for cushioning a head load

cinna vava small bat [4400 vaaval, vavvaal, vauvaal bat (flying)] [a classical Tamil term]

eeLi rat or mouse in general [710 eli rat, bandicoot] eeLi Indian mole-rat [*Bandicota bengalensis*] maram eeLi, maleyeLi "tree rat, mountain rat," whitetailed wood rat [*Rattus blanfordi*] pul eeLi "grass mouse," field mouse [*Mus* spp.]

kiiri mongoose

karuppu kiiri possibly ruddy mongoose [*Herpestes smithi*] kiiri piLLe > kiiri pule possibly common mongoose [*Herpestes edwardsi*] (also kept as a pet) [ 1344 kiiri, kiiri-piLLai mongoose, *Herpestes mungo*] teen kiiri (drinks honey; larger than the kiiri which fights

with snakes) possibly stripednecked mongoose [*Herpestes vitticollis*], but the Paliyan description also accords with zoological information on the nectar-drinking Nilgiri marten [*Martes gwatkinsi*]

maan deer [13917 maan deer, beast]

kaTati an ungulate [935 Kanncuda kaTiti a kind of deer or elk; Telugu kaTati musk deer, kaTiti nilgao, a species of antelope]; R kuccl kal "lean/stick-like legs" [1369 kuccl splinter, peg, stick]

keeLLe maan (> keeLe m. muntjac, the small barking deer [*Muntiacus muntjak* ]); R caraku maan, carukavaan, (ceruku maan) "dry leaf deer" [LT caruku dried leaf]

kuuram panni > kuuran, (koran panni), (karun p.) Indian chevrotain, the diminutive and tusked mouse deer (and young) [*Tragulus meminna*] [1578 kuur sharpness, pointed edge; 1581 Malayalam kuuran hog-deer]; R caraku maan, carukavaan, (ceruku maan) "dry leaf deer" puLLi maan chital, a spotted deer [*Axis axis*] [3550 puLLi mark, dot, speck]; R kuccl kal "lean/stick-like legs" [1369 kuccl splinter, peg, stick]

maranaaNi (> maraaNi) giant squirrel (and young; young also kept as pets) [*Ratufa indica* and *R. macroura*]

miLaa, meLaa, (meLLaa) sambar (young is also eaten and miLaa milk: is expressed through an incision in the udder of a lactating doe, when taken) [*Cervus unicolor niger*] [3867 marai sambar, Indian elk] [note (Morris 1982:741 Malapandaram mlavu (*Cervus unicolor*); R cavaLam (possibly) "spear" [EB 153 cavaLam bearded dart or lance, pike]

mocal blacknaped Indian hare (there are light and dark varieties of this southern subspecies; for a dark hare to cross one's path is a bad omen) [*Lepus nigricollis nigricollis*] [4071 muyal, mucal hare]; R kuntale kal "hopping legs"

muLLam panni > muLam p. Indian porcupine [*Hystrix indica*]; R muLLi vaanki "thorn tweezers," or "pull/fold back needles"

panni wild pig (and young) [*Sus scrofa cristatus*]; R katta kal "short legs"

vare aaTu "mountain goat," or Nilgiri tahr (swift and seldom caught) [*Hemitragus hylocrius*] [4315 varai mountain, peak, slope of hill; 4229 yaaTu, aaTu goat, sheep]

## B. 6. FOOD SPECIES AVOIDED BY SOME INDIVIDUALS

aante small owl [301 aantai owl; spotted owlet, *Athene brahma*]

kookku a large water fowl [1767 kokku common crane, *Grus cinerea*; stork, paddy bird]

pulyom great hornbill (young eaten) [*Dichoceros bicornis*]; R malai munkom "mountain loud one" [4092 muRakkam roar, thunder, make loud noise]

koranku, kooranku bonnet macaque [*Macaca radiata*] [1473kuranku monkey, ape]; R tiina tinni "food glutton" [2670 tiin food; tinni glutton]

manti langur (once human); R kompu kutipom "branch jumper" karuppu manti Nilgiri langur [*Presbytis johni*] veLLi manti common langur [*Presbytis entellus*]

maranai Nilgiri marten [*Martes gwatkinsi*] [P murra nai Nilgiri marten; LE mara naay badger]

taNNi nai smooth Indian otter [*Lutra perspicillata*] and common otter [*Lutra lutra*]

teevaanku slender loris (once human; two races of loris have been scientifically described for India and Paliyans recognize both, for they are distinct in size, coloring, and behavior) [*Loris tardigradus*] [LT teevaanku the lemur (sic)]; R mancale muutte "small, light-hued bundle"

aLukaNi t. crying eyes teevaanku (smaller than raama t. but with the same pattern of claws and nails) [240 aRu to cry weep, lament; aRukuNi tearful person, one who is always crying]

raama teevaanku variety of teevaanku (with white mark on forehead like that of religious devotees) [cf. Tamil naama teevaanku; naama the sect: mark of vaishnavas]

veraku common palm civet toddy cat [*Paradoxurus hermaphroditus*] [4520 veruku tom-cat, wild cat, toddy cat., *Paradoxurus niger*]

## B. 7. TOOLS AND AIDS IN THE EXTRACTION OF ANIMAL FOODS

eeNi ladder (for honey collecting) [L TeeNi ladder]

eerankaiyum wild onion, chewed to repel honey bees [1223 kaayam pungency, . . . garlic]

kaakkacanatti koTi an especially strong vine (for honey collecting ladder)

kaarunkoTi a vine (for honey collecting ladder)

ootankoTi an especially strong vine (for honey collecting ladder)

paalu koTi a vine (for honey collecting ladder)

taraku a pungent cutting grass (the grass blades when bruised effectively repel cukki bees)



iNTan paTTe mimosa bark (crushed and stirred in still water it. makes fish sluggish; it is preferable to other poisons because allergic reactions seem not to attend its use) [Acacia itsia caesia]  
[3205 paTTai bark of a tree]

kaarankai a fruit (smashed and mixed with maLanancu, see below, it kills fish in still water)

malanancu "hill poison," earth from an ant hill(mixed with kaarankai it helps extract the poison from the fruit)

nancu, nanci poison [2955 mancu poison, venom]

nava paTTe a bark (crushed in still water it poisons fish)

aruval billhook [LT arivaal a bill hook or sickle]

cen naay > cen nai dhole, wild red dog (which the gods use to injure animals where Paliyans will find them) [Cuon alpinus]; R viLLinari > viLLinaari "silver jackal" [cf., Tamil literary usage]

eeli kampu "rat stick/ a stick used to dig and strike Indian mole-rats [Bandicota bengalensis]

kaTuva > kaTuva "terrible mouth," a giant, 5 meter long tiger (which the gods use to injure animals where Paliyans will find them) [952 kaTu poison, astringency; severe, cruel; 4385 vaay mouth: 956 kaTuvan male monkey, tom-cat]; R carutani; R veenki [4542 veenkai riger]

paala kaampu > paala, (paalca k) spear, thrust or thrown fEB 322 vallayam a kind of spear. Parji baala spear

## NOTES

1. A preliminary version of this essay was presented at the 90th annual meeting of the American Anthropological Association in Chicago, November 1 1991. The research was made possible during 1962-64 by a Foreign Area Fellowship granted by the Ford Foundation and administered by the Joint Committee of SSRC-ACLS, during 1978 by a Faculty Summer Fellowship from the Research Council of the University of Missouri-Columbia and a travel grant from the American Institute of Indian Studies, and during 1991 by a departmental research leave. I am indebted to Br. Arochlasam, S. J., for assistance with plant identification in the field, to W.A. Noble for criticism of a draft of the manuscript and careful review of my plant and animal identifications, to P. Hockings and R. F. G. Spier for advice on several technical matters, and to R.G. Fox for discussion of the present status of the theoretical problem. While most grateful for their assistance, the author takes sole responsibility for statements made in the article. In the Paliyan Tamil terms that follow, all capital letters (other than initial letters of proper names) represent retroflex sound.s.. The name of the people (PaLiyan is the form of both the singular noun and the adjective) will be rendered without diacritics and its plural (properly PaLiyar or PaLiyarkaL) will be indicated by addition of English "s."

2. In the northernmost Paliyan range three large, metal-tipped kaampu were seen. Each had a chisel-like blade, secured by two iron bands and wooden wedges, extending about 12-14 centimeters beyond the stick. The only one of these actually observed in use was utilized conventionally.

3. I was ill at the time of the 1963 ceremony. A local teacher, M. M. Arpudam, was a hie to attend it and provide me this description.

4. One of these families was polygynous, with both women following the same practices; another family was polyandrous, with one man depending little on foraging and the other foraging seasonally.

5. One of these families was polyandrous and the men followed different practices. The older one relied for only part of the year on foraging, the younger one foraged except during the peak contracting season.

6. Were data available, it would be informative to examine also what percentage of the taxa present are used.

**Table 1 The Number of Paliyan Plant Taxa Utilized by Paliyans for Their Own Purposes**

PLANT PARTS USED	USES OF PLANT PARTS AND NUMBER OF TAXA USED			Total Taxa Used[a]
	Food	Medicine	Other	
Leaf	8	27	18	47
Flower	--	1	11	12
Fruit	30	6	3	38
Seed, nut, cotton	8	4	5	17
Root, bulb	15	13	3	28
Trunk, stem	2	3	24	28
Bark	--	9	4	12
Resin, sap	1	7	3	10
Fungus	5	--	--	5
Not known	--	3	--	3
Totals[a]	66	68	63	178

a Totals are not column and row sums because more than one part is used of eighteen plants and seventeen plants have two or more basic uses.

**Table 2 The Number of Paliyan Animal Taxa Utilized by Paliyans for Their Own Purposes**

TYPES OF FAUNA USED	USES OF FAUNA AND NUMBER OF TAXA USED			Total Taxa Used[a]
	Food	Medicine	Other	
Insect	4	3	1	5
Fish	14	--	--	14
Reptile and amphibian	3	--	2	4
Bird	14	--	6	16
Mammal	27	10	7	31
Totals	62	13	16	70

a Four honey-producing bee taxa are included and honey of three of them is used medicinally as well as for food; fourteen other taxa also have multiple uses.



Table 3 The Number of Plant Taxa Utilized for Indigenous Purposes by Kung, Gosiute, Modoc, Walbiri, and Paliyans[a]

FORAGING CULTURE	USES OF PLANTS AND NUMBER OF TAXA USED			
	Food	Medicine	Other	Total Taxa Used[b]
!Kung	103	16	32	151
Gosiute	88	46	21	141
Modoc	77	28	26	112
Walbiri	35	3	42	74
Paliyan	66	68	63	178

a Comparative data are derived from Chamberlin (1911), Lee (1979), Meggitt (1962), and Ray (1963).

b Totals are not row sums because many plants have two or more basic uses.

Table 4 The Number of Animal Taxa Utilized for Indigenous Purposes by !Kung, Gosiute, Modoc, Walbiri, and Paliyans[a]

FORAGING CULTURE	USES OF ANIMALS AND NUMBER OF TAXA USED			
	Food	Medicine	Other	Total Taxa Used[b]
!Kung	27	—	—	27
Gosiute	24	—	2	26
Modoc ca.	53	—	ca. 15	ca. 55
Walbiri	105	1	16	105
Paliyan	62	13	16	70

a Comparative data are derived from Chamberlin (1908), Lee (1979), Meggitt (1962), Ray (1963), and Steward (1938).

b Totals are not row sums, some animals having more than one basic use.

Table 5 The Number and Percentage of Paliyan Plant and Animal Taxa Collected from the Environment for Purely Paliyan Purposes, for Trade, and for Both Purposes

TYPE OF MATERIAL COLLECTED						
PURPOSE OF						
COLLECTING Plant Animal Both						
n % n % n %						
Solely Paliyan	153	75.7	63	87.5	216	78.8
Paliyan and trade	25	12.4	7	9.7	32	11.7
Solely trade	24	11.9	2	2.8	26	9.5
Totals	202	100.0	72	100.0	274	100.0

MAP: Figure 1: South Asian Foragers: Fox's Sample (Birhor, Chenchu, Kadar, Nayadi, and Vedda) and Other Recently Studied Peoples

DIAGRAM: Figure 2: Vegetation Zones on Relatively Dry and Wet Paliyan Occupied Slopes (Derived in Part from Pun 1960) Altitudes are given in meters.

MAP: Figure 3: Camps and Known Major Resources in the South-Central Paliyan Area

DIAGRAM: Figure 4: Genealogical Composition of Two Foraging Parties. Participants Are Named and Approximate Ages Are Shown of Some Individuals

DIAGRAM: Figure 5: Techniques of Fastening Vines to Form a Honey Gathering Ladder:

GRAPH: Figure 6: Calendar of the Availability and General Quality of Ten Subsistence Items and Five Types of Labor for Outsiders. Availability Is Indicated by the Density of Vertical Lines and High Quality by Additional Horizontal Lines

BIBLIOGRAPHY

Alchin, B. 1966. The Stone-tipped Arrow: Late Stone-age Hunters of the Tropical Old World. New York.

Bailey, R. C., G. Head, M. Jenike, B. Owen, R. Rohtman, and E. Zechenter. 1989. Hunting and Gathering in Tropical Rain Forest: Is it Possible? American Anthropologist 91:59-82.

Bailey, R. C., and T. N. Headland. 1991. The Tropical Rain Forest: Is it a Productive Environment for Human Foragers? Human Ecology 19:261-85.

Baliga, B. S. 1960. Madras District Gazetteers: Madurai. Madras.

Bird-David, N.H. 1988. Hunter-gatherers and Other People: A Re-examination. Hunters and Gatherers 1: History, Evolution and Social Change, eds T Ingold, D. Riches, and J Woodburn, pp. 17-30. Oxford.

—— 1990. The Giving Environment: Another Perspective on the Economic System of Gatherer-hunters. Current Anthropology 31: 189-96.

Bose, N. K. [1956. Some Observations on Nomadic Castes Castes of India. Man in India 36:1-6.

Brosius, J.P. 1991. Foraging in Tropical Rain Forests: The Case of the Penan of Sarawak, East Malaysia (Borneo). Human Ecology 19:123.50.

Burrow, T., and M. B. Emeneau 1961. A Dravidian Etymological Dictionary. Oxford.

Chamberlin, R. V 1908. Animal Names and Anatomical Terms of the Goshute Indians. Proceedings of the Academy of Natural Sciences of Philadelphia 60:74-103.

—— 1911. The Ethno-botany of the Goshute Indians. Proceedings of the Academy of Natural Sciences of Philadelphia 63:24-99.

Deetz, J. 1968. Hunters in Archaeological Perspective Man the Hunter, eds. R. B. Lee and I. DeVore, pp. 281-85. Chicago.

Dentan, R. K. 1988. Band-level Eden: A Mystifying Chimera. Cultural Anthropology 3: 276-84.

Emeneau, M. B., and T. Burrow. 1962. Dravidian Borrowings from Indo-Aryan. Berkeley.

Endicott, K., and P. Bellwood. 1991. The Possibility of Independent Foraging in the Rain Forest of Peninsular Malaysia. Human Ecology 19:151-85.

Fox, R. G. 1969. "Professional Primitives" Hunters and Gatherers of Nuclear South Asia. Man in India 49:139-60.



- Fyson, P. F. 1932. The Flora of the South Indian Hill Stations Madras.
- Gamble, J. S. 1957. Flora of the Presidency of Madras Reprint edition. Calcutta.
- Gardner, P.M. 1965. Ecology and Social Structure in Refugee Populations: The Paliyans of South India. Ph.D. dissertation University of Pennsylvania Ann Arbor.
- 1966. Symmetric Respect and Memorized Knowledge: "The Structure and Ecology of Individualistic Culture. *Southwestern Journal of Anthropology* 22:389-415
- 1972. The Paliyans. *Hunters and Gatherers Today*, ed. M. G. Bicchieri, pp 404-47. New York.
- 1982. Ascribed Austerity: A Tribal Path to Purity. *Man* 17:462-69.
- 1985. Bicultural Oscillation as a Long-term Adaptation to Cultural Frontiers: Cases and Questions. *Human Ecology* 13:411-32.
- 1988. Pressures for Tamil Propriety in Paliyan Social Organization. *Hunters and Gatherers I: History, Evolution and Social Change*, eds. T. Ingold, D. Riches, and J. Woodburn, pp. 91-106. Oxford.
- 1991a. Pragmatic Meanings of Possession in Paliyan Shamanism. *Anthropos* 86:367-84. 1991b. Foragers' Pursuit of Individual Autonomy. *Current Anthropology* 31: 543-72.
- (forthcoming) Paliyan Versatility: Foragers at the Indian Forest's Edge.
- Headland, T. N. 1987. The Wild Yam Question: How Well Could Independent Hunter-gatherers Live in a Tropical Rainforest Ecosystem? *Human Ecology* 15:465-93.
- Headland, T. N., and L. A. Reid. 1989. Hunter-gatherers and Their Neighbors from Prehistory to the Present. *Current Anthropology* 30:43-66.
- Hoffman, C. L. 1984. Punan Foragers in the Trading Networks of Southeast Asia. *Past and Present in Hunter Gatherer Studies*, ed. C. Schrire, pp. 123-49. Orlando.
- Hutterer, K. L. 1983. The Natural and Cultural History of Southeast Asian Agriculture; Ecological and Evolutionary Considerations. *Anthropos* 78:169-212.
- Kroeber, A. L. 1919. *Peoples of the Philippines*. New York.
- 1945. The Ancient Oikoumene as a Historic Culture Aggregate: The Huxley Memorial Lecture for 1945 *Journal of the Royal Anthropological Institute* 75:9-20.
- Lee, R. B. 1979. *The !Kung San: Men, Women, and Work in a Foraging Society*. Cambridge.
- LIFCO. 1962. *The Great LIFCO Dictionary: English-English-Tamil*, 6th edition. Madras.
- 1968. *TamiR-TamiR-Aankla Akaraati (Tamil-Tamil-English Dictionary)*, 2nd edition. Madras.
- Meggitt, M. J. 1962. *Desert People: A Study of the Walbiri Aborigines of Central Australia*. Chicago.
- Miller, N. E., and J. Dollard. 1941. *Social Learning and Imitation*. New Haven.
- Morris, B. 1977. Tappers, Trappers and the Hill Pandaram (South India). *Anthropos* 72:225-41.
- 1982. *Forest Traders: A Socio-economic Study of the Hill Pandaram*, London.
- Parker, H. 1909. *Ancient Ceylon: An Account of the Aborigines and a Part of the Early Civilisation*. London.
- Peterson, J. T. 1978a. The Ecology of Social Boundaries: Agra Foragers of the Philippines. *Urbana*.
- 1978b. Hunter-gatherer/Farmer Exchange. *American Anthropologist* 80:335-51.
- Prater, S. H. 1971. *The Book of Indian Animals*. 3rd edition. Bombay.
- Puri, G. S. 1960. *Indian Forest Ecology*, Vol. I. New Delhi.
- Rainbo, A. T. 1985. Primitive Polluters: Semang Impact on the Malaysian Tropical Rain Forest Ecosystem. *Museum of Anthropology, University of Michigan, Anthropological Papers*, No. 76. Ann Arbor.
- Ray, V. F. 1963. *Primitive Pragmatists: The Modoc Indians of Northern California*. Seattle.
- Romanucci Schwartz, L. 1969. The Hierarchy, of Resort in Curative Practices: The Admiralty Islands, Melanesia. *Journal of Health and Social Behavior* 10:201-9.
- Sandbukt, 1988. Tributary Tradition and Relations of Affinity and Gender among the Sumatran Kubu. *Hunters and Gatherer. 1: History, Evolution and Social Change*, eds. T. Ingold, D. Riches, and J. Woodburt, pp 107-16. Oxford.
- Seligmann, C. G., and B. Z. Seligmann 1911 *The Veddas*. Cambridge.
- Service, E. R. 1962. *Primitive Social Organization: An Evolutionary Perspective*, New York.
- Steward, J. H. 1938. Basin-Plateau Aboriginal Sociopolitical Groups. *Bureau of American Ethnology, Bulletin* 120.
- Watt, G. 1908. *The Commercial Products of India*. London.
- Williams, B. J. 1974. A Model of Band Society, *American Antiquity Memoir* 29.

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